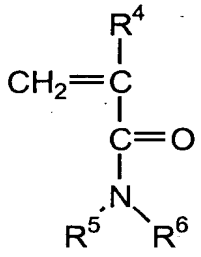
What is claimed is:

1. A polymer prepared according to a process comprising:

(a) forming a mixture comprising:

(i) at least one monomer having either formula



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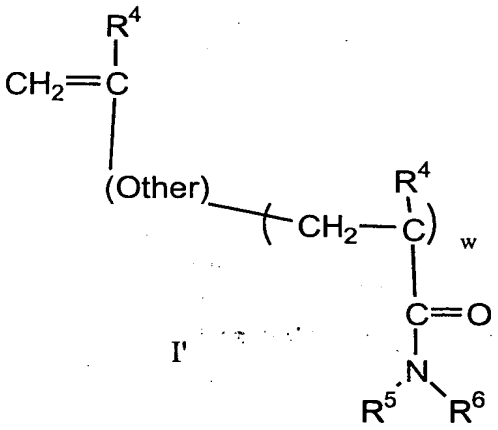

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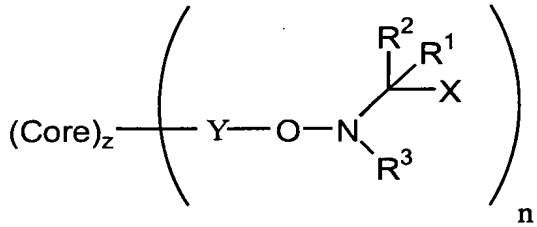
where R^4 is selected from the group consisting of hydrogen or alkyl; and R^5 and R^6, independently, are selected from the group consisting of hydrogen, alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, heteroalkyl, heterocycloalkyl, substituted heterocycloalkyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, alkoxy, aryloxy, and combinations thereof; w is a number up to 1000; and Other is a linker and contains up to 20 non-hydrogen atoms and;

(ii) a multifunctional initiator; and

(b) subjecting said mixture to polymerization conditions to form a non-linear polymer having a molecular weight of at least 75,000 daltons; a low critical solubility temperature of at least about 80°C and a viscosity suitable for capillary electrophoresis.

2. The polymer of claim 1, wherein said multifunctional initiator is characterized by the general formula $(Core)_z—(YE)_d$, wherein Core is a polyfunctional core molecule, YE is the initiator, such that the YE bond is labile enough to reversibly or irreversibly cleave through a radical mediated reaction, heat or UV light thereby forming initiating sites; and z is 1 or more; and d is 2 or more.

3. The polymer of claim 2, wherein said multifunctional initiator comprises an initiator-control agent adduct characterized by the general formula:

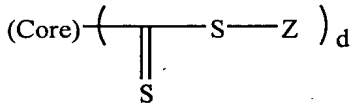


where Core is a polyfunctional core molecule; Y is a residue capable of initiating a free radical polymerization upon homolytic cleavage of the Y-O bond, the residue being selected from the group consisting of fragments derived from a free radical initiator, alkyl, substituted alkyl, alkoxy, substituted alkoxy, aryl, substituted aryl, and combinations thereof; X is a moiety that is capable of destabilizing the control agent on a polymerization time scale; and each R^1 and R^2, independently, is selected from the group consisting of alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, heteroalkyl, heterocycloalkyl, substituted heterocycloalkyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, alkoxy, aryloxy, silyl, boryl, phosphino, amino, thio, seleno, and combinations thereof; and R^3 is selected from the group consisting of tertiary alkyl, substituted tertiary alkyl, aryl, substituted aryl, tertiary cycloalkyl, substituted tertiary cycloalkyl, tertiary heteroalkyl, tertiary heterocycloalkyl, substituted tertiary heterocycloalkyl, heteroaryl, substituted heteroaryl, alkoxy, aryloxy and silyl; and z = 1 or more and n 2 or more.

4. The polymer of claim 3, wherein said core is a dendritic molecule and n is selected from the group consisting of 4, 6, 8 or 12.

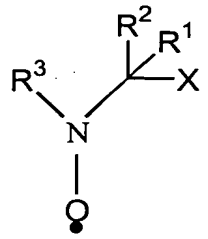
5. The polymer of claim 2, wherein said core is a polymer.

6. The polymer of claim 2, wherein said multifunctional initiator is characterized by the general formula:



wherein core is a polyfunctional core molecule; S is sulfur; Z is selected from the group consisting of amino and alkoxy; and d is 2 or more.

7. The polymer of claim 1, wherein said mixture further includes a control agent characterized by the general formula:



where X is a moiety that is capable of destabilizing the control agent on a polymerization time scale; and each R^1 and R^2, independently, is selected from the group consisting of alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, heteroalkyl, heterocycloalkyl, substituted heterocycloalkyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, alkoxy, aryloxy, silyl, boryl, phosphino, amino, thio, seleno, and combinations thereof; and R^3 is selected from the group consisting of tertiary alkyl, substituted tertiary alkyl, aryl, substituted aryl, tertiary cycloalkyl, substituted tertiary cycloalkyl, tertiary heteroalkyl, tertiary heterocycloalkyl, substituted tertiary heterocycloalkyl, heteroaryl, substituted heteroaryl, alkoxy, aryloxy and silyl.

8. A polymer according to claim 1 wherein said polymer consists essentially of units formed from said monomer.

9. A polymer according to claims 3 or 7, wherein X is hydrogen.

10. A polymer according to claim 1, wherein R^4 and R^5 and R^6 are independently selected from the group consisting of hydrogen and methyl.

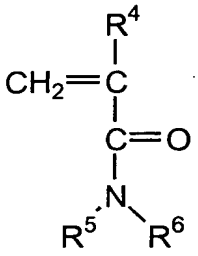
11. A polymer according to claim 1 wherein said polymer is a random copolymer that comprises at least one additional monomer.

12. A polymer according to claim 1 wherein said polymer is a block copolymer.

13. A polymer prepared according to a process comprising:

(a) forming a mixture comprising:

(i) at least one monomer having either formula



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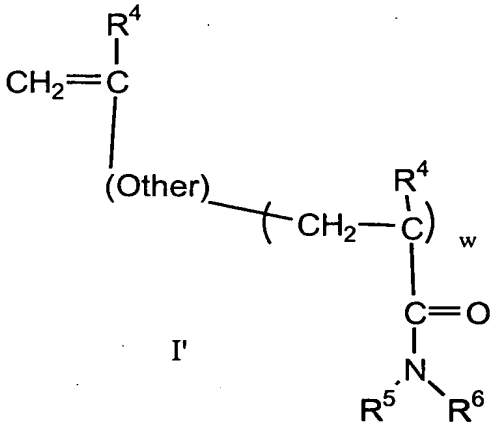

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where R^4 is selected from the group consisting of hydrogen or alkyl; and R^5 and R^6, independently, are selected from the group consisting of hydrogen, alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, heteroalkyl, heterocycloalkyl, substituted heterocycloalkyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, alkoxy, aryloxy, and combinations thereof; w is a number up to 1000; and Other is a linker and contains up to 20 non-hydrogen atoms and;

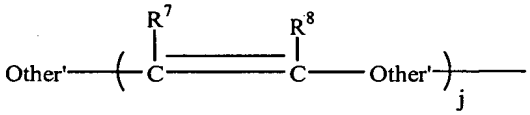
(ii) initiator;

(iii) optionally, chain transfer agent; and

(iv) at least one multi functional monomer

(b) subjecting said mixture to polymerization conditions to form a non-linear polymer having a molecular weight of at least 75,000 daltons; a low critical solubility temperature of at least about 80°C and a viscosity suitable for capillary electrophoresis.

14. The polymer of claim 13, wherein said multi-functional monomer is characterized by the general formula:



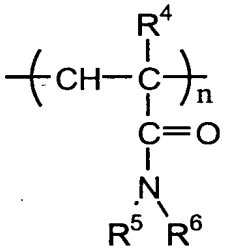
wherein Other' is linking atoms, comprising up to 50 non-hydrogen atoms; j is 2, 3 or 4; each R^7 and R^8 is independently selected from the group consisting of hydrogen, alkyl, substituted alkyl, cycloalkyl, substituted alkyl, substituted aryl and combinations thereof, and, optionally, R^7 and R^8 are joined in a ring structure; and optionally, the atoms that comprise the "other" atoms may be linked together.

15. The polymer of claim 13, wherein a chain transfer agent is present and the polymerization reaction is not controlled.

16. The polymer of claim 13, wherein said initiator is one or more living chain ends of a polymer chain.

17. The polymer of claim 13, wherein said initiator provides living type kinetics.

18. A non-linear polymer comprising repeat units having the formula:



where R^4 is H or an alkyl group; and R^5 and R^6, independently, are selected from the group consisting of hydrogen, alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, heteroalkyl, heterocycloalkyl, substituted heterocycloalkyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, alkoxy, aryloxy, and combinations thereof; and n is 10 or more; and

wherein said polymer is soluble or dispersible in water or in aqueous medium, having a weight average molecular weight of at least about 75,000 and having a polydispersity index no greater than about 2.0, and wherein said polymer comprises essentially no linking or star center groups.

19. A polymer according to claim 18 wherein said polymer consists essentially of said units.

20. A polymer according to claim 18 wherein said polymer is a copolymer.

21. A polymer according to claim 18 wherein said polymer is a block copolymer.

22. A polymer according to claim 18 wherein said polymer is a random copolymer.

23. A polymer according to claim 18 wherein said polymer has a star architecture, with a weight average molecular weight of greater that 75,000 daltons and an aqueous

solution containing about 5 % w/v of said polymer has a viscosity of less than about 600 cps.

24. A polymer according to claims 13 or 18 wherein said polymer has a weight average molecular weight, as determined by size exclusion chromatography, that is less than its actual molecular weight.

25. A polymer according to claim 13 wherein said polymer has intrinsic viscosity suitable for use in separation media for capillary electrophoresis.

26. A blend comprising:

(a) a first polymer according to claim 1, 13 or 18; and

(b) a second polymer different from said first polymer.

27. A separation medium for capillary electrophoresis comprising:

(a) the polymer of claim 1, 13 or 18; and

(b) an aqueous medium,

the separation medium having a viscosity suitable for use in capillary electrophoresis.

28. The separation medium of claim 27, wherein said polymer comprises at least 2 % w/v of the medium.

29. A method of preparing a separation medium for capillary electrophoresis comprising combining a polymer according to claim 1, 13 or 18 with an aqueous medium to form a composition having a viscosity suitable for capillary electrophoresis.

30. An electrophoresis apparatus comprising a capillary and a separation medium according to claim 29 contained within said capillary.

31. An electrophoresis apparatus comprising a capillary and a separation medium contained within said capillary, wherein said medium comprises the blend of claim 26, an aqueous medium and a viscosity suitable for use in capillary electrophoresis.

32. The apparatus of claim 30, wherein said capillaries are open or closed channels on a substrate.

33. A method of analyzing a sample by capillary gel electrophoresis comprising:

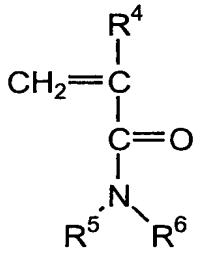
(a) adding said sample to a separation medium according to claim 29 contained within a capillary; and

(b) subjecting said sample in said capillary to an electric field.

34. A polymerization process comprising:

(a) forming a solution by combining:

(i) at least one monomer having the formula



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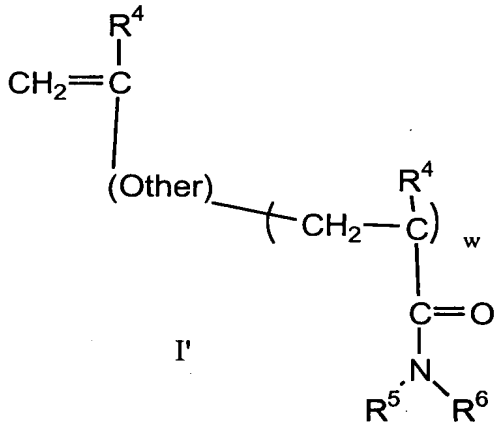

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where R^4 is selected from the group consisting of hydrogen or alkyl; and R^5 and R^6, independently, are selected from the group consisting of hydrogen, alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, heteroalkyl, heterocycloalkyl, substituted heterocycloalkyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, alkoxy, aryloxy, and combinations thereof; w is a number up to 1000; and Other is a linker and contains up to 20 non-hydrogen atoms and; and

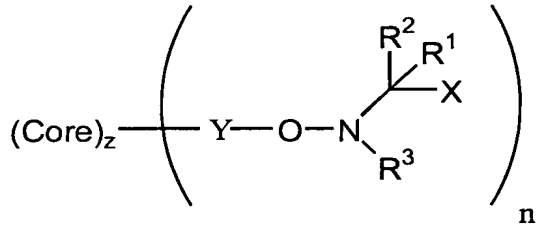
(ii) a multifunctional initiator; and

(b) subjecting said solution to polymerization conditions to form a polymer that is water-soluble or water-dispersible and is non-linear.

35. The process of claim 34,wherein said multifunctional initiator is characterized by the general formula $(Core)_z$—$(YE)_d$, wherein Core is a polyfunctional core molecule, YE is the initiator, such that the YE bond is labile enough to reversibly or irreversibly cleave through a radical mediated reaction, heat or UV light thereby forming initiating sites; and z is 1 or more; and d is 2 or more.

36. The process of claim 35, wherein said multifunctional initiator comprises an

initiator-control agent adduct characterized by the general formula:

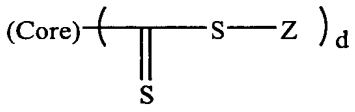


where Core is a polyfunctional core molecule; Y is a residue capable of initiating a free radical polymerization upon homolytic cleavage of the Y-O bond, the residue being selected from the group consisting of fragments derived from a free radical initiator, alkyl, substituted alkyl, alkoxy, substituted alkoxy, aryl, substituted aryl, and combinations thereof; X is a moiety that is capable of destabilizing the control agent on a polymerization time scale; and each R^1 and R^2, independently, is selected from the group consisting of alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, heteroalkyl, heterocycloalkyl, substituted heterocycloalkyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, alkoxy, aryloxy, silyl, boryl, phosphino, amino, thio, seleno, and combinations thereof; and R^3 is selected from the group consisting of tertiary alkyl, substituted tertiary alkyl, aryl, substituted aryl, tertiary cycloalkyl, substituted tertiary cycloalkyl, tertiary heteroalkyl, tertiary heterocycloalkyl, substituted tertiary heterocycloalkyl, heteroaryl, substituted heteroaryl, alkoxy, aryloxy and silyl; and z = 1 or more and n 2 or more.

37. The process of claim 36, wherein said core is a dendritic molecule and n is selected from the group consisting of 4, 6, 8 or 12.

38. The process of claim 35, wherein said core is a polymer.

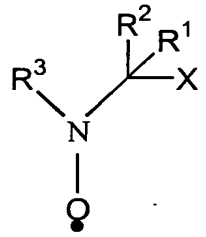
39. The process of claim 35, wherein said multifunctional initiator is characterized by the general formula:



wherein core is a polyfunctional core molecule; S is sulfur; Z is selected from the group consisting of amino and alkoxy; and d is 2 or more.

40. The process of claim 34, wherein said mixture further includes a control agent

characterized by the general formula:



where X is a moiety that is capable of destabilizing the control agent on a polymerization time scale; and each R^1 and R^2, independently, is selected from the group consisting of alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, heteroalkyl, heterocycloalkyl, substituted heterocycloalkyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, alkoxy, aryloxy, silyl, boryl, phosphino, amino, thio, seleno, and combinations thereof; and R^3 is selected from the group consisting of tertiary alkyl, substituted tertiary alkyl, aryl, substituted aryl, tertiary cycloalkyl, substituted tertiary cycloalkyl, tertiary heteroalkyl, tertiary heterocycloalkyl, substituted tertiary heterocycloalkyl, heteroaryl, substituted heteroaryl, alkoxy, aryloxy and silyl.

41. A process according to claim 34 wherein said polymer consists essentially of units formed from said monomer.

42. A process according to claims 36 or 42, wherein X is hydrogen.

43. A process according to claim 34, wherein R^4 and R^5 and R^6 are independently selected from the group consisting of hydrogen and methyl.

44. The process of claim 34, wherein said process is an aqueous solution process and said solution additionally comprises water.

45. A method for separating a biomolecule by capillary gel electrophoresis, the method comprising:

filling a capillary with a separation media, the capillary having a diameter or width of not more than about 25 μm,

loading the biomolecule into the capillary, and

presenting an electric field accross the capillary.

46. The method of claim 45 further comprising flushing the separation medium from

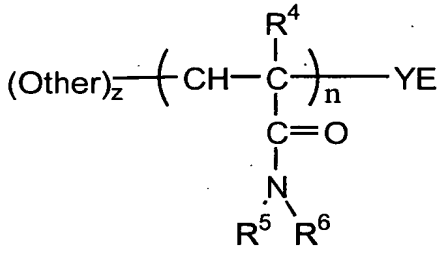
the capillary.

47. The method of claim 46 further comprising refilling the capillary with additional quantities of separation medium.

48. A polymerization process comprising:

(a) forming a solution by combining:

(i) at least one living-type polymer chain of the general formula



wherein R^4 is selected from the group consisting of hydrogen or alkyl; and R^5 and R^6, independently, are selected from the group consisting of hydrogen, alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, heteroalkyl, heterocycloalkyl, substituted heterocycloalkyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, alkoxy, aryloxy, and combinations thereof; where YE is an initiating moiety that can reversibly or irreversibly cleave through a radical mediated reaction, heat or UV light; and Other comprises up to 50 non-hydrogen atoms, and z is 0 or 1; and

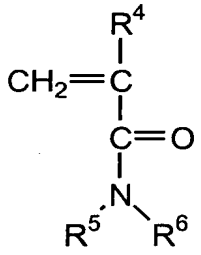
(ii) at least one multi-functional monomer; and

(b) subjecting said solution to polymerization conditions to form a polymer that is water-soluble or water-dispersible and is a non-linear having a molecular weight of at least 75,000 daltons; a low critical solubility temperature of at least about 80°C and a viscosity suitable for capillary electrophoresis.

49. A process comprising:

(a) forming a mixture comprising:

(i) at least one monomer having either formula



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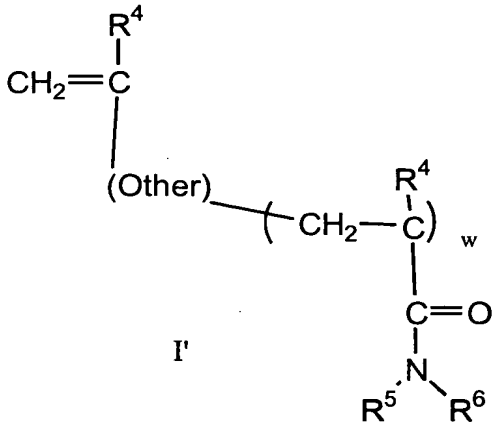

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where R^4 is selected from the group consisting of hydrogen or alkyl; and R^5 and R^6, independently, are selected from the group consisting of hydrogen, alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, heteroalkyl, heterocycloalkyl, substituted heterocycloalkyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, alkoxy, aryloxy, and combinations thereof; w is a number up to 1000; and Other is a linker and contains up to 20 non-hydrogen atoms and;

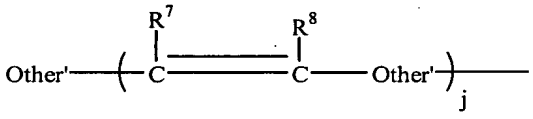
(ii) initiator;

(iii) optionally, chain transfer agent; and

(iv) at least one multi functional monomer

(b) subjecting said mixture to polymerization conditions to form a non-linear polymer having a molecular weight of at least 75,000 daltons; a low critical solubility temperature of at least about 80°C and a viscosity suitable for capillary electrophoresis.

50. The process of claim 49, wherein said multi-functional monomer is characterized by the general formula:



wherein Other' is linking atoms, comprising up to 50 non-hydrogen atoms; j is 2, 3 or 4; each R^7 and R^8 is independently selected from the group consisting of hydrogen, alkyl, substituted alkyl, cycloalkyl, substituted alkyl, substituted aryl and combinations thereof, and, optionally, R^7 and R^8 are joined in a ring structure; and optionally, the atoms that comprise the "other" atoms may be linked together.